ASSIGNMENT 5

Textbook Assignment: "Sewage Treatment and Disposal," "Compressed Air Systems," and "Boilers." Pages 10-32 through 12-14.

5-1. What type of wastewater system eliminates the need for septic tanks, cesspools, or leaching fields?

1. Holding ponds
2. Polishing ponds
3. Common sewers
4. Storm sewers

5-2. What is the minimum desirable size of a septic tank?

1. 500 gallons
2. 1,000 gallons
3. 1,250 gallons
4. 2,000 gallons

5-3. When a septic tank discharges into a leaching field greater than 500 feet in length, you should incorporate what component(s) into the system ?

1. Dosing tank only
2. Siphon only
3. Dosing tank and siphon
4. Inlet and outlet filters

5-4. Regardless of size, a septic tank should be inspected at what standard intervals?

1. 6 months
2. 2 months
3. 12 months
4. 18 months

5-5. At what minimum distance from a septic tank should a (a) shallow well and (b) deep well be located?

1. (a) 200 feet (b) 50 feet
2. (a) 200 feet (b) 75 feet
3. (a) 100 feet (b) 50 feet
4. (a) 100 feet (b) 75 feet

5-6. Leaching cesspools should be located what minimum distance from each other?

1. 10 feet
2. 20 feet
3. 30 feet
4. 40 feet

5-7. Perforated pipe of what size should be used in leaching fields?

1. 10-inch diameter
2. 8-inch diameter
3. 6-inch diameter
4. 4-inch diameter

5-8. What is the maximum allowable length of a leaching field lateral?

1. 50 feet
2. 75 feet
3. 100 feet
4. 125 feet

5-9. When a leaching field becomes inoperable, you must consider what option?

1. Chemical cleaning
2. System replacement
3. Adding additional piping
4. Pumping the septic tank

5-10. Low-pressure systems provide compressed air at a maximum of how many pounds per square inch gauge (psig)?

1. 25
2. 75
3. 100
4. 125

5-11. Medium-pressure systems provide compressed air from 126 psig to what maximum pressure?

1. 299 psig
2. 325 psig
3. 399 psig
4. 425 psig

5-12. High-pressure systems provide compressed air within what pressure range?

1. 400 psig to 4,000 psig
2. 400 psig to 6,000 psig
3. 425 psig to 4,000 psig
4. 425 psig to 6,000 psig

5-13. What type of shop or laboratory requires up to 6,000 psig of compressed air?

1. Torpedo workshop
2. Testing laboratory
3. Wind tunnel
4. Ammunition depot

5-14. Air compressor filter systems should be able to remove particles in what micron size range?

1. 1 to 3
2. 2 to 5
3. 3 to 7
4. 4 to 9

5-15. Of the following grades of commercial compressed air, which one is the most pure?

1. B
2. D
3. F
4. H

5-16. A refrigerant dryer with a dew point at what maximum temperature should be used to remove moisture to meet air quality requirements for instrument and control air?

1. 20°F
2. 30°F
3. 35°F
4. 40°F

5-17. With pressure in excess of 400 psig, oil causes what compression phenomenon to occur?

1. Burnout
2. Blowout
3. Combustion
4. Recycling

5-18. In a reciprocating compressor, what are the three compression cycle phases?

1. Intake, multistage pressurization, discharge
2. Intake, impeller rotation, compression
3. Intake, single-stage pressurization, discharge
4. Intake, compression, discharge

5-19. In a W-type compressor, there are a total of how many cylinders in the (a) first and (b) second stages?

1. (a) One (b) one
2. (a) Two (b) two
3. (a) Two (b) one
4. (a) One (b) two

5-20. What type of compressor has two mating rotating screws, one locked and one grooved, to provide the driving force?

1. Rotary
2. Reciprocating
3. Helical
4. Centrifugal

5-21. When the load is reasonably constant, what type of compressor is intended for near-continuous industrial air service?

1. Rotary
2. Reciprocating
3. Helical
4. Centrifugal

5-22. When placed through a parapet roof, you should extend air intakes what approximate distance above the roof?

1. 6 to 8 feet
2. 8 to 10 feet
3. 10 to 12 feet
4. 12 to 14 feet

5-23. Of the following types of intake filters, which one(s) is/are best suited for use in locations where dust is prevalent in the atmosphere?

1. Oil bath only
2. Viscous impingement only
3. Oil bath and viscous impingement
4. Oil injected and centrifugal lubricated

5-24. The intercooler in a multistage compressor serves what purpose?

1. To lower the temperature of discharged air
2. To remove condensation and impurities from the air flow
3. To reduce the temperature of compressed air between each stage
4. To add cool air at the beginning of each cycle

5-25. Aftercoolers are used in compressor discharge lines for which of the following reasons?

1. To permit the use of larger discharge pipes
2. To lower the air discharge temperature only
3. To facilitate condensation and removal of moisture only
4. To lower the air discharge temperature and facilitate condensation and removal of moisture

5-26. Separators are used in conjunction with aftercoolers for what purpose?

1. To remove water and oil from the compressed air
2. To reduce working pressure in the distribution lines
3. To separate noncondensable gases from the compressed air
4. Each of the above

5-27. Compressor cylinder oil should have what minimum flash-point temperature?

1. 325°F
2. 350°F
3. 375°F
4. 400°F

5-28. Pulsation dampeners serve as pulsation and noise mufflers due to what feature within the dampener?

1. An injector
2. A vibration amplifier
3. An acoustical chamber
4. A sound resonator

5-29. The inlet valve unloading device functions mechanically to remove compression loads from the prime mover by

1. disengaging the drive clutch
2. holding the inlet valve open during the suction and compression strokes
3. opening the cylinder relief valve
4. holding the inlet valve closed during the compression stroke

IN ANSWERING QUESTIONS 5-30 AND 5-31, REFER TO FIGURE 11-22.

5-30. When the receiver pressure has dropped from 100 psi to 94 psi, U(2) causes the compressor to operate at what percentage of its total output capacity?

1. 25%
2. 50%
3. 75%
4. 100%

5-31. When the compressor is operating at 25 percent of capacity, the inlet unloader valves should be in what position?

1. U(4) energized; U(1), U(2), and U(3) de-energized
2. Each unloader valve energized
3. U(4) de-energized; U(1), U(2), and U(3) energized
4. Each unloader valve de-energized

5-32. The volume of air that can be released from a compressor cylinder into one clearance pocket is equal to what percentage of the cylinder volume?

1. 25%
2. 50%
3. 75%
4. 100%

5-33. When sizing a prime mover, you should take which of the following factors into consideration?

1. Availability of a dc power source
2. Availability of unleaded fuel
3. Compressor size in rpm
4. Belt or drive losses of power

5-34. Belt selection for a large motor should be based on what ideal percentage of motor size?

1. 100%
2. 125%
3. 150%
4. 175%

5-35. What type of air distribution system is used for isolated service or in situations where special requirements dictate a single path?

1. Parallel
2. Loop
3. Radial, one way
4. Radial, two way

5-36. What type of closed-route air distribution system can be used throughout a building?

1. Parallel
2. Loop
3. Radial, one way
4. Radial, two way

5-37. Normally, a compressed air distribution system is sized by calculating what factor?

1. Friction loss
2. Pipe size
3. Compressor size
4. Oil loss

5-38. In situations where compressed air pipes are pitched upward causing condensate to flow against the flow of air, e minimum pitch of how many inches per hundred feet should be allowed?

1. 10
2. 2
3. 6
4. 4

5-39. When testing e system with dry air or nitrogen, you should use what percentage of maximum working pressure for a minimum of 4 hours?

1. 75%
2. 100%
3. 125%
4. 150%

5-40. What maintenance program prevents most major prime-mover breakdowns?

1. Manufacturer
2. Operator
3. Equipmentman
4. Construction Mechanic

5-41. When a manufacturer's recommended tolerance level between two moving parts is exceeded on a compressor, you must perform which, if any, of the following actions?

1. A component adjustment only
2. An equipment overhaul only
3. A component adjustment or an equipment overhaul
4. None of the above

5-42. Air filters should be checked and cleaned a minimum of how often?

1. Daily
2. Weekly
3. Monthly
4. Quarterly

5-43. For assistance in air system maintenance and inspection, you should refer to what NAVFAC publication?

1. P-320
2. P-322
3. P-324
4. P-330

5-44. When done properly, what is the most important single point in the successful operation of a boiler?

1. Installation
2. Selection of the site
3. Accessory procurement
4. Quality of replacement parts

5-45. A boiler should normally be installed in which of the following locations?

1. Close to the galley
2. Close to the laundry
3. Near the area of greatest load demand
4. Near the area of least load demand

5-46. When constructing a boiler foundation you must adhere to what specifications?

1. ASME
2. NAVFAC
3. Manufacturer
4. Organizational

5-47. The main steam stop valve must be a rising spindle type, if the valve is over what size?

1. 1 inch
2. 2 inches
3. 3 inches
4. 4 inches

5-48. What type of valve is located between the main steam stop valve and the guard valve?

1. Relief
2. Daylight
3. Pressure regulating
4. Temperature regulating

IN ANSWERING QUESTIONS 5-49 AND 5-50, REFER TO FIGURE 12-1.

5-49. What accessory is depicted by number 10?

1. Drip leg
2. Root valve
3. PRV
4. TRV

5-50. What accessory is located near number 15?

1. Feed pump
2. Condensate tank
3. Strainer
4. Relief valve

5-51. Refer to foldout figure 12-2. What fitting is depicted by number 8?

1. Gauge glass
2. Glass blowdown
3. Pressure gauge
4. Try cock

5-52. Boilers having a heating surface in excess of 100 square feet must be provided with blowdown piping and fittings in what size range?

1. 1 inch to 2 1/2 inches
2. 1 1/4 inches to 2 1/4 inches
3. 1 1/2 inches to 2 1/2 inches
4. 1 3/4 inches to 2 3/4 inches

5-53. You should manually lift each safety valve to clean it at what intervals?

1. Weekly
2. Biweekly
3. Monthly
4. Quarterly

5-54. Steam piping that is buried or inaccessible requires a drip leg at intervals of not over how many feet?

1. 400
2. 300
3. 200
4. 100

5-55. Normally, a root valve is what type of valve?

1. Butterfly
2. Altitude
3. Globe
4. Gate

5-56. The pressure gauge on a boiler should be tested at what intervals?

1. Annually
2. Semiannually
3. Quarterly
4. Monthly

5-57. As a minimum, high-pressure, HTW, and MUSE boilers require a hydrostatic test at what intervals, in years?

1. 1
2. 2
3. 3
4. 4

5-58. When chemically treating a boiler, you should maintain what recommended residual for phosphate?

1. 20 to 40 ppm
2. 25 to 50 ppm
3. 30 to 60 ppm
4. 35 to 70 ppm

5-59. Assume the original wall thickness of a tube is 0.225 inch anti an exploring block has been cut and examined. What wall thickness requires complete renewal of all tubes from front to rear of the boiler and from center row to outer row, inclusive?

1. 0.110 inch
2. 0.115 inch
3. 0.120 inch
4. 0.125 inch

5-60. Under what conditions can a boiler be steamed with tubes that are pitted to a depth of 50 to 65 percent of their wall thickness?

1. When the boiler has been chemically cleaned
2. When the boiler can withstand a hydrostatic test of 125 percent of design pressure
3. When future boiler water treatment, use of blowdown, and laying-up procedures conform to NAVFAC requirements
4. Each of the above

5-61. What type of tube defect has scattered pits caused by dissolved oxygen that are relatively short and narrow?

1. Waterside cavities
2. Waterside grooves
3. Localized pitting
4. Corrosion fatigue

5-62. At what temperature can waterside burning occur in plain carbon steel tubes?

1. 650°F
2. 750°F
3. 900°F
4. 1000°F

5-63. When defects are discovered during waterside inspection of drums and headers or other pressure parts of the boiler, you should take what action?

1. Report the defects to the maintenance officer
2. Record the defects in the maintenance log
3. Record the defects in the boiler water treatment log
4. Each of the above

5-64. A hydrostatic test of 125 percent of boiler design pressure is acquired at which of the following times?

1. After renewing downcomers
2. After rolling superheater support tubes
3. After renewal of pressure parts
4. After cleaning firesides

5-65. Before cleaning a boiler with an operating pressure of 600 psi, you should hydrostatically test it at what pressure?

1. 150 psi
2. 600 psi
3. 750 psi
4. 900 psi

5-66. A hydrostatic test at 150 percent of design pressure is basically what type of test?

1. Tightness of gaskets
2. Strength of boiler
3. Tightness of valve seats
4. Each of the above

5-67. After repairs are made to a boiler and before applying a hydrostatic test, you should perform each of the following actions with what exception?

1. Gauging boiler safety valves
2. Flushing out the boiler with water
3. Closing all boiler connections and vents
4. Inspecting the boiler for scale and dirt

5-68. When hydrostatically testing a boiler, you can avoid complications due to temperature changes by

1. continuously operating the main feed pump
2. using water of the same temperature as the boiler and the fireroom
3. using water with temperature below 70°F
4. using hot water from the deaerating feed tank

5-69. A tube seat can be considered tight under which of the following circumstances?

1. It has been rerolled
2. It is bone dry
3. It has been renewed
4. It is only slightly cracked

5-70. The purpose of a 5-year test and inspection is to check what boiler elements?

1. Welds and nozzle connections
2. Handhole and manhole seats
3. Safety valves and welded parts
4. Internal fittings and air vents